

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for winding a stator of a brushless direct current motor having a stator body with a pre-determined number of stator teeth, wherein the stator teeth are respectively wound with two coils which are magnetically coupled and which permit the generation of opposite magnetic fields by the supply of current with variable directional orientation, and wherein each of the two coils comprises a predetermined number of conductors, the method comprising the steps of:

a) simultaneously winding each of the two coils into onto said stator teeth in several partial winding steps with an even number of  $2n$  conductors, allocating a first set of  $n$  conductors of the  $2n$  conductors to a first coil of said two coils and allocating the other set of  $n$  conductors of the  $2n$  conductors to a second coil of said two coils; and,

b) repeating step a) until the predetermined number of conductors per coil has been reached.

2-10 (Canceled)

11. (Currently Amended) A coil winding method for winding a predetermined number of conductors to form a set of magnetically coupled coil pairs on a plurality of stator teeth of a stator body in a motor, each set of coil pairs generating opposing magnetic fields in the plurality of stator teeth, the coil winding method comprising the steps

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

of:

in a first partial coil winding step, simultaneously winding  $2n$  conductors together onto a first plurality of stator teeth of said stator body, a first group  $n_1$  of said  $2n$  conductors being assigned to a first coil of said set of magnetically coupled coil pairs and a second group  $n_2$  of said  $2n$  conductors being assigned to a second coil of said set of magnetically coupled coil pairs; and,

repeating said simultaneous winding of said  $2n$  conductors until said predetermined number of conductors are wound onto said first plurality of stator teeth to form a first magnetically coupled coil pair of said set of magnetically coupled coil pairs.

12. (Previously Presented) A coil winding method for winding a predetermined number of conductors to form a set of magnetically coupled coil pairs on a plurality of stator teeth of a stator body in a motor, each set of coil pairs generating opposing magnetic fields in the plurality of stator teeth, the coil winding method comprising:

- a) in a first partial coil winding step, simultaneously winding  $2n$  conductors together onto a first plurality of stator teeth of said stator body;
- b) selecting a first group  $n_1$  of said  $2n$  conductors and assigning the first group  $n_1$  to a first coil of said set of magnetically coupled coil pairs;
- c) selecting a second group  $n_2$  of said  $2n$  conductors and assigning the second group  $n_2$  to a second coil of said set of magnetically coupled coil pairs;
- d) repeating steps a) through c) until said

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

predetermined number of conductors are wound onto said first plurality of stator teeth to form a first magnetically coupled coil pair of said set of magnetically coupled coil pairs; and,

winding said predetermined number of conductors on a second plurality of stator teeth of said stator body in said motor to form a second magnetically coupled coil pair of said set of magnetically coupled coil pairs.

13. (Previously presented) The method according to claim 12 wherein the step of winding said predetermined number of conductors on said second plurality of stator teeth includes the steps of:

e) in a second partial coil winding step, simultaneously winding  $2n$  conductors together onto a second plurality of stator teeth of said stator body;

f) selecting a third group  $n_3$  of said  $2n$  conductors and assigning the third group  $n_3$  to a third coil of said set of magnetically coupled coil pairs;

g) selecting a fourth group  $n_4$  of said  $2n$  conductors and assigning the fourth group  $n_4$  to a fourth coil of said set of magnetically coupled coil pairs; and,

h) repeating steps e) through g) until said predetermined number of conductors are wound onto said second plurality of stator teeth to form said second magnetically coupled coil pair of said set of magnetically coupled coil pairs.

14. (Previously presented) The method according to claim 13 wherein;

the first partial coil winding step includes

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

simultaneously winding said 2n conductors onto said first plurality of stator teeth different from said second plurality of stator teeth; and,

the second partial coil winding step includes simultaneously winding said 2n conductors onto said second plurality of stator teeth different from said first plurality of stator teeth.

15. (Previously presented) The method according to claim 14 wherein:

the first partial coil winding step of simultaneously winding said 2n conductors onto said first plurality of stator teeth includes simultaneously winding two conductors onto said first set of six stator teeth; and,

the second partial coil winding step of simultaneously winding said 2n conductors onto said second plurality of stator teeth includes simultaneously winding two conductors onto said second set of six stator teeth.

16. (Previously Presented) A coil winding method for winding a predetermined number of conductors to form a set of magnetically coupled coil pairs on a plurality of stator teeth of a stator body in a motor, each set of coil pairs generating opposing magnetic fields in the plurality of stator teeth, the coil winding method comprising:

a) in a first partial coil winding step, simultaneously winding 2n conductors together onto a first plurality of stator teeth of said stator body;

b) selecting a first group  $n_1$  of said 2n conductors and assigning the first group  $n_1$  to a first coil

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

of said set of magnetically coupled coil pairs;

c) selecting a second group  $n_2$  of said  $2n$  conductors and assigning the second group  $n_2$  to a second coil of said set of magnetically coupled coil pairs; and,

d) repeating steps a) through c) until said predetermined number of conductors are wound onto said first plurality of stator teeth to form a first magnetically coupled coil pair of said set of magnetically coupled coil pairs; and, wherein: the step of assigning said first group  $n_1$  of said  $2n$  conductors includes, prior to performing each said at least one first partial winding step, connecting said first group  $n_1$  of said  $2n$  conductors to a first electrical connection contact  $15_I$  on said stator body, and the step of assigning said second group  $n_2$  of said  $2n$  conductors includes, prior to performing each said at least one first partial winding step, connecting said second group  $n_2$  of said  $2n$  conductors to a second electrical connection contact  $15_{II}$  on said stator body.

17. (Previously presented) The method according to claim 16 wherein:

the step of assigning said first group  $n_1$  of said  $2n$  conductors further includes, after performing said each at least one first partial winding step, connecting said first group  $n_1$  of said  $2n$  conductors to a third electrical connection contact  $15_{III}$  on said stator body; and,

the step of assigning said second group  $n_2$  of said  $2n$  conductors further includes, after performing said each at least one first partial winding step, connecting said second group  $n_2$  of said  $2n$  conductors to a fourth electrical connection contact  $15_{IV}$  on said stator body.

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

18. (Currently Amended) A stator having a stator body defining a plurality of stator teeth carrying conductors to form a set of magnetically coupled coil pairs, the conductors being wound onto said stator teeth by:

in a first partial coil winding step, forming a first coupled coil pair by:

a) simultaneously winding  $2n$  conductors together onto a first plurality of stator teeth of said stator body;

b) selecting a first group  $n_1$  of said  $2n$  conductors and assigning the first group  $n_1$  to a first coil of said first coupled coil pair; and,

c) selecting a second group  $n_2$  of said  $2n$  conductors and assigning the second group  $n_2$  to a second coil of said first coupled coil pair; and,

repeating steps a) through c) until said predetermined number of conductors are wound onto said first plurality of stator teeth whereby said predetermined member of conductors are intermingled achieving a close mutual proximity to form said first magnetically coupled coil pair of said set of magnetically coupled coil pairs, the first magnetically coupled coil pair having a substantially uniform winding distribution.

19. (Currently Amended) A stator having a stator body defining a plurality of stator teeth carrying conductors to form sets of magnetically coupled coil pairs, the conductors being wound onto said stator teeth by:

a) in a first partial coil winding step,

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

simultaneously winding a first pair of conductors together onto a first plurality of stator teeth of said stator body;

b) selecting a first group  $n_1$  of said first pair of conductors and assigning the first group  $n_1$  to a first coil of said set of magnetically coupled coil pairs;

c) selecting a second group  $n_2$  of said first pair of conductors and assigning the second group  $n_2$  to a second coil of said set of magnetically coupled coil pairs;

d) repeating steps a) through c) until a first predetermined number of conductors are wound onto said first plurality of stator teeth whereby said first predetermined number of conductors are intermingled achieving a close mutual proximity to form a first magnetically coupled coil pair;

e) in a second partial coil winding step, simultaneously winding a second pair of conductors together onto a second plurality of stator teeth of said stator body different from said first plurality of stator teeth;

f) selecting a third group  $n_3$  of said second pair of conductors and assigning the third group  $n_3$  to a third coil of said set of magnetically coupled coil pairs;

g) selecting a fourth group  $n_4$  of said second pair of conductors and assigning the fourth group  $n_4$  to a fourth coil of said set of magnetically coupled coil pairs; and,

h) repeating steps e) through g) until a second predetermined number of conductors are wound onto said second plurality of stator teeth whereby said second predetermined number of conductors are intermingled achieving a close mutual proximity to form a second magnetically coupled coil pair.

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

20. (Previously presented) A coil winding method for winding a predetermined number of conductors to form a set of magnetically coupled coil pairs on a plurality of stator teeth of a stator body in a motor, each set of coil pairs generating opposing magnetic fields in the plurality of stator teeth, the coil winding method comprising:

- a) in a partial coil winding step, simultaneously winding  $2n$  conductors together onto a first plurality of stator teeth of said stator body;
- b) selecting a first group  $n_1$  of said  $2n$  conductors and assigning the first group  $n_1$  to a first coil of said set of magnetically coupled coil pairs by, prior to performing said partial winding step, connecting said first group  $n_1$  of said  $2n$  conductors to a first electrical connection contact on said stator body;
- c) selecting a second group  $n_2$  of said  $2n$  conductors and assigning the second group  $n_2$  to a second coil of said set of magnetically coupled coil pairs by, prior to performing said partial winding step, connecting said second group  $n_2$  of said  $2n$  conductors to a second electrical connection contact on said stator body; and,
- d) repeating steps a) through c) until said predetermined number of conductors are wound onto said first plurality of stator teeth to form a first magnetically coupled coil pair of said set of magnetically coupled coil pairs.

21. (Previously presented) A coil winding method for winding a predetermined number of conductors to

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

form a set of magnetically coupled coil pairs on a plurality of stator teeth of a stator body in a motor, each set of coil pairs generating opposing magnetic fields in the plurality of stator teeth, the coil winding method comprising:

- a) in a first partial coil winding step, simultaneously winding a first pair of conductors together onto a first plurality of stator teeth of said stator body;
- b) selecting a first group  $n_1$  of said first pair of conductors and assigning the first group  $n_1$  to a first coil of said set of magnetically coupled coil pairs;
- c) selecting a second group  $n_2$  of said first pair of conductors and assigning the second group  $n_2$  to a second coil of said set of magnetically coupled coil pairs;
- d) repeating steps a) through c) until said predetermined number of conductors are wound onto said first plurality of stator teeth to form a first magnetically coupled coil pair of said set of magnetically coupled coil pairs;
- e) in a second partial coil winding step, simultaneously winding a second pair of conductors together onto a second plurality of stator teeth of said stator body different from said first plurality of stator teeth;
- f) selecting a third group  $n_3$  of said second pair of conductors and assigning the third group  $n_3$  to a third coil of said set of magnetically coupled coil pairs;
- g) selecting a fourth group  $n_4$  of said second pair of conductors and assigning the fourth group  $n_4$  to a fourth coil of said set of magnetically coupled coil pairs; and,
- h) repeating steps e) through g) until said

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

predetermined number of conductors are wound onto said second plurality of stator teeth to form said second magnetically coupled coil pair of said set of magnetically coupled coil pairs.

22. (Currently Amended) A stator having a stator body defining a plurality of stator teeth carrying conductors to form a set of magnetically coupled coil pairs, the conductors being wound onto said stator teeth by:

forming a first magnetically coupled coil pair by:

a) simultaneously winding  $2n$  conductors together onto a first plurality of stator teeth of said stator body;

b) selecting a first group  $n_1$  of said  $2n$  conductors and assigning the first group  $n_1$  to a first coil of said first coupled coil pair; and,

c) selecting a second group  $n_2$  of said  $2n$  conductors and assigning the second group  $n_2$  to a second coil of said first coupled coil pair;

repeating steps a) through c) until said a first predetermined number of conductors are wound onto said first plurality of stator teeth whereby said first predetermined number of conductors are intermingled achieving a close mutual proximity to form said first magnetically coupled coil pair of said set of magnetically coupled coil pairs;

forming a second magnetically coupled coil pair by:

d) simultaneously winding  $2n$  conductors together onto a second plurality of stator teeth of said stator body;

e) selecting a first group  $n_1$  of said

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

2n conductors and assigning the first group  $n_1$  to a first coil of said second coupled coil pair; and,

f) selecting a second group  $n_2$  of said 2n conductors and assigning the second group  $n_2$  to a second coil of said second coupled coil pair;

repeating steps d) through f) until said a second predetermined number of conductors are wound onto said second plurality of stator teeth whereby said second predetermined number of conductors are intermingled achieving a close mutual proximity to form said second magnetically coupled coil pair of said set of magnetically coupled coiled pairs.

23. (Previously Presented) The method according to claim 11 further including:

winding said predetermined number of conductors on a second plurality of stator teeth of said stator body in said motor to form a second magnetically coupled coil pair of said set of magnetically coupled coil pairs.

24. (Previously Presented) The method according to claim 23 wherein the step of winding said predetermined number of conductors on said second plurality of stator teeth includes the steps of:

e) in a second partial coil winding step, simultaneously winding 2n conductors together onto a second plurality of stator teeth of said stator body;

f) selecting a third group  $n_3$  of said 2n conductors and assigning the third group  $n_3$  to a third coil of said set of magnetically coupled coil pairs;

Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003

g) selecting a fourth group  $n_4$  of said  $2n$  conductors and assigning the fourth group  $n_4$  to a fourth coil of said set of magnetically coupled coil pairs; and,

h) repeating steps e) through g) until said predetermined number of conductors are wound onto said second plurality of stator teeth to form said second magnetically coupled coil pair of said set of magnetically coupled coil pairs.

25. (Previously Presented) The method according to claim 24 wherein;

the first partial coil winding step includes simultaneously winding said  $2n$  conductors onto said first plurality of stator teeth different from said second plurality of stator teeth; and,

the second partial coil winding step includes simultaneously winding said  $2n$  conductors onto said second plurality of stator teeth different from said first plurality of stator teeth.

26. (Previously Presented) The method according to claim 25 wherein:

the first partial coil winding step of simultaneously winding said  $2n$  conductors onto said first plurality of stator teeth includes simultaneously winding two conductors onto said first set of six stator teeth; and,

the second partial coil winding step of simultaneously winding said  $2n$  conductors onto said second plurality of stator teeth includes simultaneously winding two conductors onto said second set of six stator teeth.

*Application No. 09/508,934  
Amendment dated February 13, 2004  
Reply to Office Action of November 19, 2003*

27. (Previously Presented) The method according to claim 11 wherein:

the step of assigning said first group  $n_1$  of said  $2n$  conductors includes, prior to performing each said at least one first partial winding step, connecting said first group  $n_1$  of said  $2n$  conductors to a first electrical connection contact  $15_I$  on said stator body; and,

the step of assigning said second group  $n_2$  of said  $2n$  conductors includes, prior to performing each said at least one first partial winding step, connecting said second group  $n_2$  of said  $2n$  conductors to a second electrical connection contact  $15_{II}$  on said stator body.

28. (Previously Presented) The method according to claim 27 wherein:

the step of assigning said first group  $n_1$  of said  $2n$  conductors further includes, after performing said each at least one first partial winding step, connecting said first group  $n_1$  of said  $2n$  conductors to a third electrical connection contact  $15_{III}$  on said stator body; and,

the step of assigning said second group  $n_2$  of said  $2n$  conductors further includes, after performing said each at least one first partial winding step, connecting said second group  $n_2$  of said  $2n$  conductors to a fourth electrical connection contact  $15_{IV}$  on said stator body.